



Magazine  
JANUARY 1961





The *ICI Magazine*, price twopence, is published for the interest of all who work in ICI, and its contents are contributed largely by people in ICI. Edited by Sir Richard Keane, Bt., and printed at The Kynoch Press, Birmingham, it is published every month by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London, S.W.1 (Phone: VICTORIA 4444). The editor is glad to consider articles and photographs for publication, and payment will be made for those accepted.

VOLUME 39 NUMBER 289

# The I C I Magazine

JANUARY 1961

## Contributors



**George Ashton** is Marketing Manager for Ilford Ltd. After training as a pharmacist he switched to photography in the RAF during the war; he has remained in the photographic industry ever since, working in turn in photographic retailing, the film industry, and as a magazine editor. His hobby is colour photography, and he is the author of a successful book on this subject.



**Robert le G. Burnett** works in the Development Department of General Chemicals Division. He gave a talk on his hobby of collecting musical boxes for the BBC Home Service last summer, and some of the tunes of his musical boxes were played over the air.



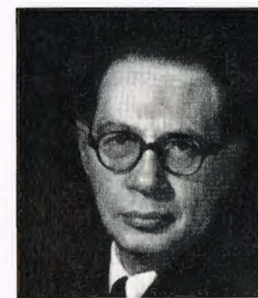
**Percy Cudlipp** was editor of the London "Evening Standard" for four years and of the "Daily Herald" for fourteen years before he decided to explore what was for him an entirely new field—that of science journalism. He has edited the "New Scientist" since its foundation in 1956. He is also a frequent broadcaster.



**B. R. Goodfellow**, who has been concerned with overseas affairs for thirty years, is a keen mountaineer. His travels for ICI and on war service have enabled him to visit a number of distant mountain regions. In this number he describes his impressions of Nepal, which he has visited twice.

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## POINT of VIEW

WHAT IS FAIR?

By Mark Abrams

SINCE the country is not in a state of complete stagnation, it is inevitable that from time to time the Government has to change the amount of money it spends on various public services and the wages that are paid to people in public employment. What economic and social principles should guide these changes? Increasingly, those directly affected by the changes have urged new levels of Government spending based on comparisons.

FOR example, it has been said that more should be spent on the health services because current expenditure on these amounts to only 4% of the national income, whereas ten years ago it was nearly 5% of the national income. Again, it has been argued that present-day expenditure on the public information services is inadequate because today it is only a quarter of what it was ten years ago.

And the same sort of comparative approach dominates salary discussions between the Government and those in public employment. The Royal Commission on Doctors' Remuneration indicated that doctors' earnings should be kept in line with those of other professional people "of similar attainments and education." And, more

recently, teachers have demanded that their salaries must go up because policemen's pay has gone up.

Now it would be very foolish to argue that this sort of approach is irrational and should therefore be brushed aside. It is irrational; but that does not make it any the less real, and some serious regard must be paid to it. But these comparisons should not be the beginning and the end of the discussions; they should be only part of them—and sometimes a very minor part.

The real and decisive test of whether the Government is spending enough or paying enough should be entirely different. It should be, very simply, is the Government spending enough to achieve what it set out to do?

IF we keep this principle firmly in mind, one can appreciate the possibility that when in 1950 nearly 5% of the national income was spent on the health services we were not spending enough, and that today, when the figure is nearer 4%, we may be spending too much. Ten years ago there was probably more to do than there is today.

Similarly, teachers today may be underpaid not because they are getting less than policemen (if they are), but

because at the present rates of pay for teachers there may not be enough young men and women entering the teaching profession to reach the Government's goals of reducing the size of classes and raising the quality of British education. This is the consideration that should dominate the discussion, not some irrelevant comparisons with policemen's pay.

If this more rational approach were adopted, it might even lead to a more sensible policy about "differentials" within the teaching profession. For example, for some time there has been in our schools an acute shortage of qualified teachers of mathematics and science.

THE shortage has been greatest in the North and in girls' schools. It looks like persisting because we stick to the comparative approach; and this says that the teachers we need most must not be paid more than any other teachers—it wouldn't be fair.

We ought, more often, to face up to the fact that there is a conflict between this sort of fairness and the more efficient pursuit of our social ends. If we did, we would at least stand a better chance of realising what is the cost of our irrationality.

The opinions expressed in this article are not necessarily those of the Company



# A NEW BREAK-THROUGH IN PLASTICS

## — its name is POLYPROPYLENE and it —

Polypropylene was discovered in Italy, and is made by ICI under licence from Montecatini. This plastic has great potentialities, and ICI's 11,000 tons a year plant, now on stream at Wilton, is several months ahead of competitors.

Contributed by Plastics and Fibres Division

IF a fairy godmother had appeared to any plastics chemist ten years ago and offered him a brand-new plastic at the wave of a wand, he would almost certainly have leaped at the chance and said: "Splendid! Make me a polymer that's lighter than anything we have at present, easily moulded, tough, rigid and yet flexible, able to stand up to quite high temperatures and all sorts of chemicals, and—don't go yet—it must be reasonably cheap."

Well, today we have the accomplished fact before us in the shape of polypropylene. It's rigid enough to replace materials such as metal and wood in many applications, strong and flexible enough to replace natural fibres in textiles and ropes, clear enough to make sparkling film. You can boil it, bend it, jump on it, soak it in acid. And it is made from a gas—propylene—that is plentiful wherever oil is cracked to make petrochemicals.

You can find out about its virtues for yourself by looking in the shops for houseware bearing a label to say that it is made from 'Propathene'—ICI's brand name for polypropylene. There is not a very wide variety of 'Propathene' ware in the shops yet (laundry baskets and drinking beakers are two examples); but as ICI's 11,000 tons a year plant at Wilton—the first in Britain—really gets into its stride, 'Propathene' will become as well known as 'Alkathene.'

Polypropylene is the result of some brilliant research work on the Continent. The implications of this work—not only for plastics, but for other fields

of chemistry—are so important that the history of polypropylene deserves some paragraphs of its own.

It all started about seven years ago, when a German academic chemist, Professor Karl Ziegler, discovered a new group of catalysts. One of them, he found, would polymerise ethylene—that is to say, link up ethylene molecules in long chains—to give polythene. Ziegler polythene became known as low-pressure polythene, because the catalyst made it possible to dispense with the very high pressure involved in the ICI process. It had different properties from high-pressure polythene—higher density, stiffness and softening point, for example—because its molecules were arranged with great symmetry and had few branches or side chains. Low-pressure and high-pressure polythene, the first two of the polyolefines family, have coexisted happily ever since, complementing each other's properties.

Then the story moved to Italy, where another academic chemist, Professor Natta, was carrying out research with Ziegler catalysts. Since the discovery of polythene it had been every chemist's dream that he might one day be able to form long chains of molecules from olefines other than ethylene, and so invent a completely new plastic. But all attempts to do this, either with catalysts or high pressure, had given rise only to sticky messes with no commercial future.

Using a Ziegler catalyst, Natta achieved the success that had eluded everyone else. He polymerised propylene in a manner that produced quite a different

\* *IS CHEAP* because it is made from a gas always plentiful wherever oil is cracked to make petrochemicals.

\* *IS LIKE A STIFFER POLYTHENE*—stiff enough when thick to replace metal and wood for some purposes, yet flexible and tough enough when thin to act, for example, as a hinge.

\* *STANDS UP TO BOILING WATER* and therefore may be used for hot-water piping.

\* *MAKES LOVELY GLOSSY WRAPPING MATERIAL*—shinier and less waxy than polythene and much stronger.

\* *AS A FIBRE PROMISES* soft, bulky knitwear with long-wearing properties and springy carpets and blankets that will recover quickly from crushing.

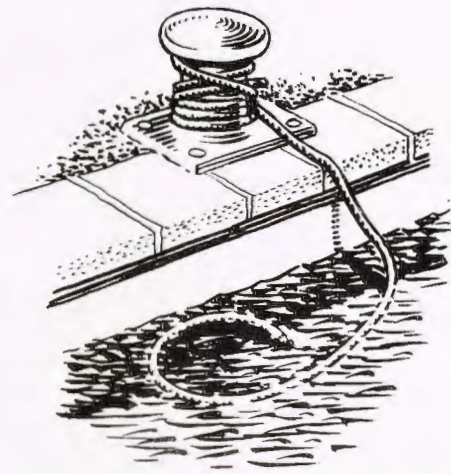
**Polypropylene crystals**—the material which the moulder and extruder of plastic goods uses. The natural colour of the crystals is white, but they are marketed in a wide range of colours



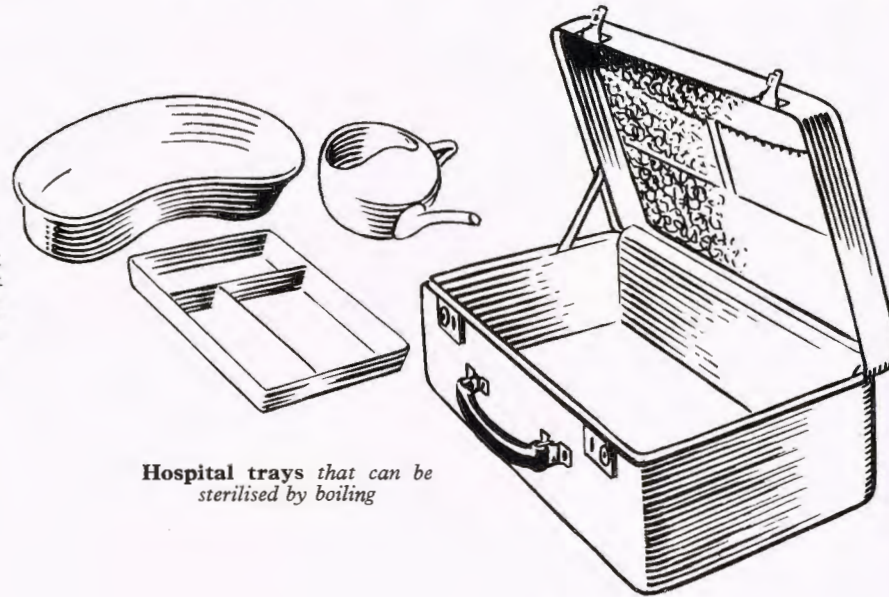
**An earlier polypropylene**—the useless sticky substance produced when polypropylene was first polymerised, before Professor Natta of Montecatini pioneered an entirely different polymer with unique and desirable properties



# SOME OF THE POLYPROPYLENE GOODS YOU MAY SEE IN THE SHOPS



Rope that floats and so won't get entangled with the propeller



Hospital trays that can be sterilised by boiling

Suitcases with "built-in" polypropylene hinge

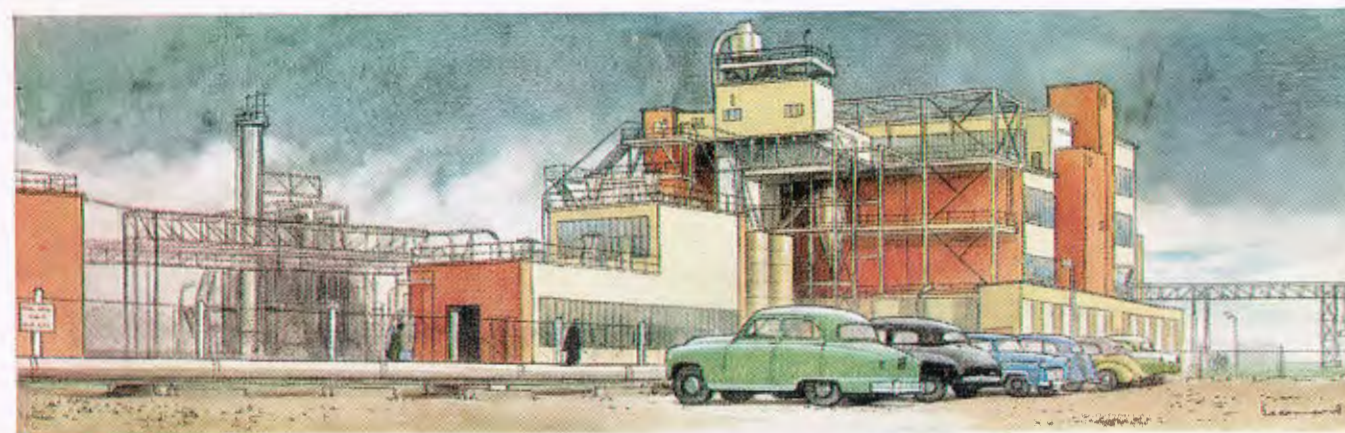
substance. And his polymer, from the start, was obviously a winner.

The real importance of Natta's polypropylene lay in its structure. Natta coined a new word for it: isotactic, meaning "set up in a regular way." The polypropylene molecules had all linked up, so to speak, facing the same direction.

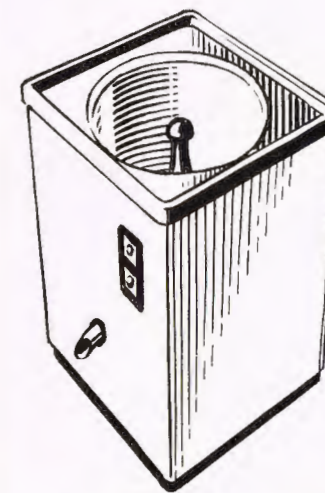
The catalyst that had this almost magical disciplinary effect on the usually unruly molecules was a combination of aluminium and titanium. Neither Professor Ziegler nor any other chemist would be offended by the statement that catalysts are one of the branches of chemistry in which practice is still ahead of theory. It is possible to arrive at results

without fully understanding the mechanism responsible. To this day no one can claim to understand fully why molecules of propylene should arrange themselves isotactically when in the presence of the aluminium-titanium catalyst. One can imagine an isotactic polymer as a long chain of children, all holding hands and all facing the same way. The question is, why does each new "child" joining the chain infallibly link its left hand with the right hand of the child at the end of the chain and so face the same way as its fellows?

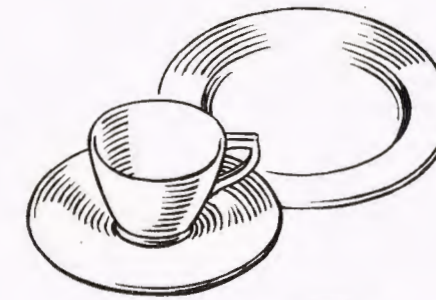
A great deal of work is being done, in this country and elsewhere, to find out the secret of this and similar catalysts. Meanwhile another chemical,



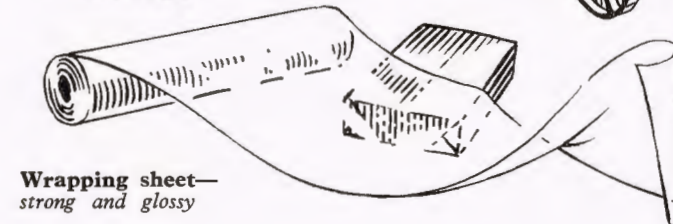
An artist's impression of the Wilton polypropylene plant



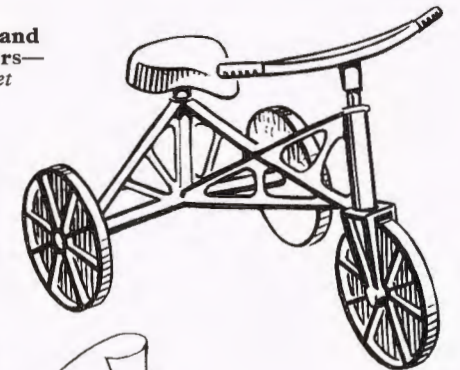
Washing machines that will cost less to make and won't need painting



Cups and Saucers—light yet strong



Wrapping sheet—strong and glossy



Children's tricycles—made entirely of polypropylene without any metal. Lighter and cheaper

isoprene, has been polymerised with their help to form a rubber identical with natural rubber. Nature is adept at producing perfectly regular long-chain molecules—as in rubber, hair and wool—by means of her own catalysts, called enzymes. If a Ziegler catalyst can be used in place of an enzyme to produce "natural" rubber, we may be on the threshold of some startling discoveries about the chemical processes of living cells.

If ICI didn't discover polypropylene it did the next best thing: recognised its importance, negotiated a patent licence from the Italian chemical firm of Montecatini, and took energetic steps to exploit the new plastic. By acting quickly we have established a lead of several months over our future competitors in this country, whose plant is expected to come on stream at the end of this year.

Before obtaining our licence from Montecatini we had to satisfy ourselves that the expenditure of millions of pounds on a polypropylene plant would bring a fair return. Assessing the demand for a new material is never easy. In the case of polypropylene we had to forecast not only how many new uses would be found for a new material, but how far it would eat into markets occupied by other plastics. In the moulded houseware field, for example, would polythene surrender any of its sovereignty? It looked as if polypropylene would compete, offering greater rigidity and the possibility of thinner mouldings at

much the same cost. Would polypropylene have an edge on the established insulating materials or packaging films?

All this had to be investigated. But it is an established fact that, by and large, new plastics do not replace old ones so much as open up new markets. With this in mind, as soon as the licensing agreement was signed we devoted the output of a pilot-scale ICI polypropylene plant, supplemented by material bought from the U.S.A., to development work.

Some uses emerged at once as dead certainties. Polypropylene's excellent rigidity and heat resistance made it an obvious choice to replace metal in washing machines, for example. We discovered that the makers of women's stiletto shoe heels had been looking for just such a material as this; so had the makers of joints and fittings for underground service pipes, and the makers of corrosion-resistant chemical plant. In one way and another the demand, on paper, fully justified a plant with a capacity of 11,000 tons a year.

Then the practical work began. Plastics users want facts and figures about a new material. Does it creep? Can it be flexed repeatedly without cracking? What kind of mould is needed? Will it extrude? The only way to provide them with the answers is by tests in the Technical Service laboratories.

You might have seen one day, at the Welwyn headquarters of Plastics Division, the bizarre sight of

(Continued on page 15)



## THE ICI ILFORD TIE-UP

By George Ashton

**Just over two years ago a tie-up was announced between ICI and Ilford Limited, the famous photographic firm. The two companies agreed that ICI would buy a one-third interest in the ordinary share capital of Ilford and carry out research for them, while Ilford would take over ICI's colour photography process in exchange for royalty payments. Here is a brief look at ICI's partner in this agreement.**

THIS one's a bit under-exposed, but it's Molly and the two kids at Ramsgate . . ." "This is where the car broke down on the Grossglockner . . ." "Here's our youngest, having a paddle . . ."

All summer, camera shutters have been popping like platefuls of breakfast cereal. Now the returned holiday-makers, with acres of black-and-white prints, colour prints and colour transparencies to their credit, are showing them with pride to their neighbours. If you happen to be one of the neighbours you may take a jaundiced view of photography's surging popularity, but to the firms that make films, cameras and equipment Britain's 12 or 13 million amateur photographers are a major source of income. Among these firms Ilford Limited is the biggest of the British-owned and one of the biggest in the world, ranking with Agfa, Kodak and Gevaert. In recent years turnover has expanded rapidly and the horizon is bright as far ahead as one can see. This is the business in which ICI now has an important stake.

The Ilford story begins in a very humble way, with a pioneer called Alfred H. Harman making photographic dry plates in the basement of his house in Ilford, Essex. He started with the proverbial two men and three boys as staff, but by 1886 he had expanded production and moved to more spacious premises, and in 1898 the business became the public company of Ilford Limited with a capital of £380,000.

Rule-of-thumb manufacturing methods served well enough at the start. But at the close of the nineteenth century serious scientific research began. One of the Ilford pioneers was F. F. Renwick, who joined the firm in 1899 and was director of research when he died in 1943. He became famous for his work on the response of photographic materials to light, and was responsible, with others, for introducing the British-made sensitising dyes used for the first Ilford panchromatic plates in 1914. Ilford made other important advances under his research leadership: the introduction of hypersensitive panchromatic and infra-red sensitive plates and films, for example, double-coated X-ray films and Multigrade variable-contrast enlarging paper.

In 1906, when Maj.-Gen. Sir Ivor Philipps became chairman, Ilford was still quite a small business, with fewer than 300 employees. Philipps bought several old-established photographic firms and added them to Ilford, and under the chairmanship of his nephew, the Hon. J. P. Philipps, another big expansion and modernisation programme has been taking place. Ilford now employs 4000 people; operates plants at Mobberly in Cheshire, Brentwood and Basildon in Essex, and Richmond in Surrey as well as at Ilford itself; and owns subsidiaries in Australia and the U.S.A. There are Ilford branches, agencies or distributors in nearly every country in the world, and about half the Company's output goes abroad.

Although the amateur market is an important one, the Company serves photography in all its branches: advertising and commercial work, cinematography, document copying, the graphic arts, instrument recording, and medical and industrial radiography. In some of these fields it has led the way. Mass radiography, for example—now so widely used for chest examinations—was developed by the Ilford Department of Radiography and Medical Photography. Ilford nuclear emulsions—specialised emulsions used for nuclear research—are the only ones produced in the Western world, and have made it possible for physicists to discover at least five new types of elementary particle in the last ten years. A landmark in photographic history is Ilford 'Phenidone'—a new non-toxic developing agent, one of the few really efficient innovations to have emerged in this field for many years.

Ilford has matched scientific progress with ultra-modern production processes. The new film-coating units that came into operation in 1952 made the company the largest manufacturers of X-ray film on this side of the Atlantic. Ilford film base—the transparent plastic on which the light-sensitive emulsion is laid—is now made by a subsidiary owned jointly by Ilford and British Xylonite instead of being imported for hard currency. Developers, fixers and other processing chemicals are packed in highly mechanised plant, and an entirely new department has been started for producing the 'Azoflex' materials used for copying drawings, plans and documents.

The photo-finishing trade, which develops and prints most of the films taken by amateurs, is an important Ilford customer. The 'Roll-head,' 'Synchromat' and 'Kenprinter' machines are world-famous, and a great deal of work is currently being done in the Ilford laboratories on other automatic processing equipment. At the other end of the photographic production line are the cameras. The latest Ilford range—the moderately priced 'Sportsman' 35 mm. cameras—has already proved very popular.

What can ICI contribute to this flourishing business? First of all, the services of the Commonwealth's largest centre of organic chemical research—the Dyestuffs Division laboratories at Blackley. Organic chemistry lies behind all photographic materials, and there is no doubt that the chemists at Blackley, with their very wide experience of dyes and pigments, can usefully complement Ilford's own research chemists.

Secondly, the ICI-Ilford agreement made over ICI's own colour photographic process to Ilford for exploitation,



**Glass photographic plates** being taken off the coating machine at Ilford's Essex factory. Glass plates are still widely used in commercial and industrial photography

in exchange for royalties. Ilford have marketed a 35 mm. reversal colour film for twelve years and since 1953 have been supplying colour prints from customers' transparencies. The ICI colour film is a negative-positive one—that is to say, it yields colour prints direct. It is already on the market under the name 'Ilfacolor' and may prove to be a powerful weapon in the battle of the colour-film giants. In 1955, it is reckoned, only one in every 22 of the shots taken by amateurs was in colour. In 1957 it was one in every seven; in 1959, one in every five; no figures are available for this year, but colour seems to have been used as a matter of course by amateurs. The increase in the use of colour by professionals is apparent in the volume of full-colour advertising photographs now appearing.

So the battle is on, and Kodak, with their extensive footing in the market, will not easily be dislodged. Agfa, with the Agfacolor range, which includes a negative-positive film, are also well established with Ferranicolor, Gevacolor, Pakolor and Raycolor as runners-up. If Ilfacolor enables Ilford Limited to steal a march on its competitors in the near future, then the ICI-Ilford agreement will have borne early—and profitable—fruit.



# THE STORY OF HUMAN SKILL

Two years ago a monumental enterprise—*A History of Technology* in five volumes—was completed with the backing of ICI. Now, to meet the needs of those for whom 4000 pages costing £42 is a little too much of a good thing, *A Short History of Technology* costing 38s. has been written. It is reviewed by Percy Cudlipp, editor of the *New Scientist*.

THE writing of history has already undergone one change for the better during this century. Historians have become less preoccupied with the makers of wars and laws; they pay more regard than did their nineteenth-century predecessors to the part played by economic and social influences in the story of Man.

A second progressive change has now begun. It is being realised that the acquisition of technological knowledge and skills was likewise among the fundamentals of history. Inventions like the wheel and the boat, advances like the cultivation of the soil and the fashioning of metals, were more decisive in the march of civilisation than the mightiest emperors or the bloodiest wars. The tools of war itself are among the fruits of technology—as are some of the greatest triumphs of medicine and surgery. The vast technological expansion that started in Britain in the mid-eighteenth century was as potent in its political as in its economic consequences. As Sir Charles Snow has written: "The steam engine helped to shape the modern world at least as much as Napoleon and Adam Smith."

All this seems so obvious that it is astonishing that any historian writing in the twentieth century should have cast science and technology in comparatively incidental roles. However, the balance is being redressed, and a new book which should do much to expedite the process is *A Short History of Technology*, by T. K. Derry and Trevor I. Williams (Clarendon Press, Oxford, 38s.).

The Short History is an offspring of a much larger work—the *History of Technology*, which was begun eleven years ago and has been published, also by the Clarendon Press, in five volumes. The History was endowed by ICI, and the late Dr. Charles Singer, the late Dr. E. J. Holmyard, Dr. A. R.

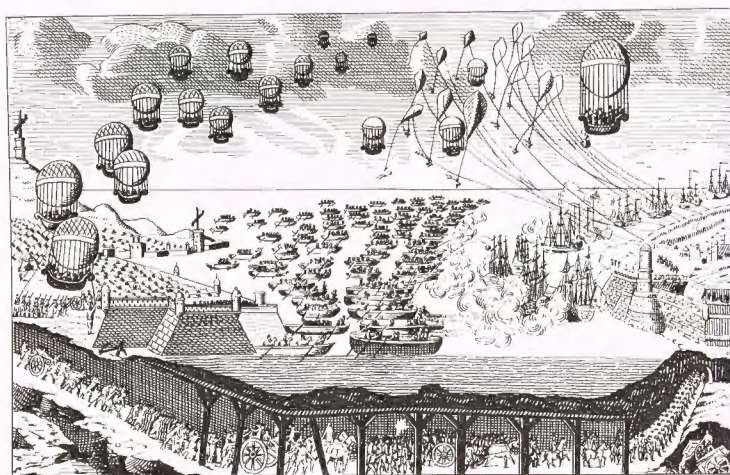
Hall and Dr. Trevor Williams were appointed to plan and collate the contributions from many authoritative sources. Their efforts, and those of their authors, resulted in a work of encyclopaedic range, great scholarship and high literary distinction.

Many reviewers of the History urged that a shorter version should be published at a price within reach of a wider circle of readers, and ICI again agreed to provide the necessary endowment. Hence *A Short History of Technology*.

It has turned out, however, to be something much more than an abridged version of the History. Although the Short History is a substantial volume, an attempt to compress the contents of 4400 pages into 782 could not possibly have succeeded. So Dr. Derry, who is an historian, and Dr. Williams, who was managing editor of the later volumes of the original History (and is editor of ICI's international science review *Endeavour*), have written a completely new book, covering the same ground but with a different approach. They have taken particular pains to demonstrate the close interaction of technological and political developments—showing how, at times, technological progress has changed the course of history, and at others, political change has influenced technology.

The book is divided into two parts, each preceded by a general historical survey. The first part, of nine chap-

ters, tells the story of technology from the Palaeolithic Age to the dawn of the Industrial Revolution in 1750: the story of Man's first experiments in agriculture, in the preparation of food and drink, in the making of articles for his domestic need, and in the extraction and working of metals. There are chapters on building construction, transport, communication, and early sources of power.



**Invasion by Channel tunnel.** This print of 1805 depicts an imaginary French invasion of England by balloon and tunnel. The English forces fly man-carrying kites in defence

# People and events . . .

## The Chairman visits Russia

THE Chairman, Mr. S. P. Chambers, and Mrs. Chambers, accompanied by Mr. J. Peel, head of East European Department, and Mrs. Peel, visited the Soviet Union for a week on 26th November. The visit had been suggested to the Chairman by the Soviet Ambassador in London, and he was the guest of the State Scientific and Technical Committee of the Council of Ministers of the USSR.

The Chairman had a discussion with Mr. A. N. Kosygin, First Deputy Prime Minister of the Soviet Union. He also met Mr. V. S. Federov, President of the Committee for Chemistry, Mr. K. D. Petukhov, President of the State Scientific and Technical Committee, and other prominent officials from the Ministry of Finance, Gosbank, the State Planning Committee and the Ministry of Foreign Trade. Both in Moscow and in Leningrad the Chairman was able to ask many questions relating to Soviet methods of planning, economic organisation and standards of living, and he also dealt with many questions from the Russian side about ICI's organisation and export policy. The meeting with the Ministry of Finance was of particu-

lar interest, as the Deputy Minister, Mr. P. A. Maletin, was a friend and colleague of the Chairman for two years in Berlin when he was chief of the Finance Division of the British Element of the Control Commission for Germany at the end of the war.

On their last evening in Moscow, the Chairman, together with Mrs. Chambers, spoke for five minutes on television.

The Chairman and his party attended some superb ballets at the Bolshoi Theatre, including gala performances of "The Fountain of Bakhchisarai" and "Swan Lake," at one of which Mr. Khrushchev was present.

The Chairman and his party at London Airport



## Board Reorganisation

SOME modifications in the organisation of the higher direction of the Company were announced in December.

Notable points are that the Fibres, Heavy Organic Chemicals and Plastics Divisions have been grouped under one director, Mr. C. Paine, that the Billingham and Nobel Divisions are under Mr. R. A. Banks, and that Research and Development will be under one director, Dr. J. Ferguson. There are three overseas directors, Mr. R. C. Todhunter, Dr. A. Caress and Dr. J. S. Gourlay.

The system of controlling capital expenditure has been revised. In brief, the limits within which Division boards, the group and overseas directors and the capital programme committee can authorise capital expenditure without further reference to the next higher authority have been considerably increased, provided the proposals do not exceed by certain fixed amounts a budget already approved by the Board.

The Board will meet only once a month instead of every fortnight as at present, and the Chairman's conference will also meet only once a month instead of every fortnight.

Overseas affairs have been grouped in eleven areas; and the Company's operations and developments in each area will be closely reviewed once a year in all their aspects at an overseas conference.

Similarly, the affairs of each Division will be exhaustively examined once a year at a Division conference.

For the regular consideration of the long-term planning and development of the Company's activities, five group committees have been set up under the



chairmanship of the respective group directors. Each group committee will meet once a quarter.

### Bigger and Better Ideas

**B**EGINNING this month, the Company is launching a poster campaign aimed at improving both the number and quality of ideas submitted under the ICI Suggestion Scheme. Eight Divisions of ICI are taking part in the campaign, which is being organised by Central Labour Department.

The campaign begins with a series of posters appealing to a man's knowledge of his own job, and each invites suggestions on one particular aspect of method improvement. This month's, for example, draws attention to cutting out waiting time.

The latest statistics available for the Suggestion Award Scheme are for the twelve months ending 30th June 1960. Just over 9000 awards were made; 4523 were for 30s. or less, 62 were for more than £10. (The top award of £684 went to **Mr. Horace Clarke**, now an apprentice instructor in Alkali Division.) The total amount paid out was £28,542.

### Wooded with Eggs

**D**AWSON City, famous boom town of the gold rush days, lies not far from the Arctic Circle in Canada's remote north-west. Consuelo Allen, wife of **Mr. P. C. Allen** (CIL President), was lucky enough to visit it recently and sent us these impressions.

"Today," she writes, "the population of Dawson City is 850 (it was 30,000 in the 1890s). The boardwalks are still there, and many of the old buildings, but it is a ghost city. The unpaved streets are lined by broken-down houses. Inside, the floors are strewn with paper, tables lie upturned. In a shop that used to sell bicycles the wares are still on display, but thickly coated with dust. In an ironmonger's shop implements hang abandoned on the walls. The nightmarish quality is heightened by the crazy tilting of all the buildings. For Dawson is in the perma-frost belt: in summer the ground thaws to a depth of only a foot, heaving and pushing at foundations as it does so.

"Incidentally, it is a macabre thought that even the roughest and toughest of the gold rush characters who met their end in the Yukon earned a kind of immortality: in the permafrost bodies never decompose."

One of the few survivors of Dawson in its heyday supports himself today by yarning, at 25 cents a time, about life in the gold rush days. The cost of living then was fantastic, and, so one



legend goes, a famous Yukon belle was wooed with eggs (they cost \$1 each) instead of flowers by a prospector who had struck it rich.

Why does anyone stay in Dawson now? Well, the old-timers didn't get all the gold. At the Yukon Consolidated Gold Mine's office Mrs. Allen saw gold bars worth \$250,000 ready for shipping out by plane the following day. Methods have changed, though, since '98. A big dredger claws at the sides and bed of the river, fetching up a mixture of sand and gold for panning. About 175 tons produce 1 oz. of gold.

### Numismatologist

**T**HE description of a coin collector as "a miser with a conscience" has been taken to heart by **Mr. D. W. Evans** (Billingham Division), who wrote the article on old coins in our Christmas issue. Not wishing to develop, he says, into a second Silas Marner, he makes a point of changing parts of his collection at regular intervals. This policy has led to a correspondence with coin collectors from all over the country and even from Canada and the USA.

However, there are a few special

items which he admits he has no intention of ever parting with. Among these are the token coins of Stockton-on-Tees and the surrounding district, one of which we featured last month.

Mr. Evans began collecting some years ago. As a shopkeeper before he joined ICI, some ten years ago, he occasionally discovered foreign coins in the till. Mild curiosity about these strangers led him to the local library in search of a book on the subject and started him off on his now absorbing hobby. These days, besides coins, he also collects old medals.

Mr. Evans is a member of the Accounts Department at Billingham Division. His father, **Mr. D. J. Evans**, who came to work in the "construction" days, is also still employed there, as a clerk on the Sulphuric Acid Plant.

### Olympic Training

**A** LETTER to his Ardrossan home a few weeks ago brought a much-prized invitation to 17-year-old **Hugh Bryden** of Ardeer box factory. Written by Dunky Wright, president of the Scottish Amateur Athletics Association, it invited him to attend a special weekly coaching class for Scotland's potential Empire and Olympic Games athletes.

Mr. Bryden is a member of Ardeer Recreation Club athletics section. Commenting on the invitation, **Mr. James Morgan**, athletics secretary of the club, said he had undoubtedly caught the eye of SAAA officials by the consistency of his efforts in the youths' 100 and 220 yard events last season.



Mr. Bryden

"Just how well he was running can be seen from the fact that towards the end of the season his handicap was down to half a yard. Only the champion runs off scratch, and it is a rare thing for him to be in the first three. But even at half a yard Hugh was still being placed."

The coaching course, for Scotland's most promising male athletes, started in Glasgow last month. Targets of the SAAA are the Empire Games, due to be held at Perth, Australia, in 1962 and the Olympic Games two years later in Tokyo.

### E. M. Fraser

**A**N account of Jock Fraser's career in ICI and, during the war, at the War Office and the Ministry of Aircraft Production appeared in the *Magazine* on his retirement less than three years ago, and this is therefore a more personal appreciation of his qualities, writes **Mr. G. K. Hampshire**.

I first met him when I joined Brunner, Mond in 1923, by which time, after four years in the Company, his ability had attracted the eye of J. G. Nicholson, then Brunner, Mond's Commercial Director, and Jock himself had been appointed, among other things, Home Director of all Brunner, Mond's overseas companies. I, as a young chemist thrown, after a short time in the research department, into Brunner's sales department, found life somewhat strange and shall always be most grateful for the help and advice he gave me at that time. I worked for Mr. Fraser for some years after the formation of ICI and learned to respect his courtesy and consideration for others and kindly guidance of a younger man.

He was a classical scholar and never forgot his classical training; he was always ready with a Greek or Latin quip. His approach to commercial problems was of the kind to be expected from one who had read Greats at Oxford but was often tempered with a flash of intuition, some of which, no doubt, he had caught from his close association with J. G. Nicholson, with whom he worked for so many years.

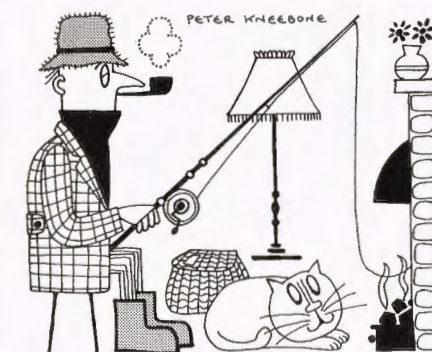
He had an appreciation of all the good things in life—particularly good

books, good talk and good company. Those of us who, like myself, grew up in the Company with him will always have a soft spot in our hearts for his memory and be grateful for the privilege of having known him.

### Fishy Story

**W**HO ever heard of a goldfish coming down a chimney? It happened recently at the Sutton, Surrey, home of **Mr. Tom Jelfs**, an employee at Alkali Division's Paper Goods factory.

Mr. and Mrs. Jelfs were awakened one night by noises in the bedroom chimney. Investigating, Mr. Jelfs found in the grate a soot-covered object which wriggled. It looked like a fish, so he put it in a bucket of water, and in seconds it was revealed as a seven-inch-long goldfish. The noises continued throughout the night, and when they prodded up the chimney with a flue brush the next morning a huge brown owl flew off.



After asking in the district if anyone had lost a goldfish, without result, Tom Jelfs gave Sooty to a colleague, **Mr. David Lawrance**, who has a pond in his garden.

Reports of the incident appeared in the *Sunday Express* and *Sunday Dispatch*, as a result of which the Sunday calm of the Jelfs and Lawrance households was shattered.

The first telephone call came at 9 a.m., the caller explaining that his wife couldn't rest until she knew how the poor goldfish was faring, and three times more through the day Mr. Lawrance was called upon to supplement the newspaper report. But perhaps the most amusing result of this publi-

city was the arrival of a scootist, complete with bowl and net, who had come to collect "his" fish, which he claimed he had lost the previous week. However, it turned out that his fish had not disappeared until after Sooty had arrived down the chimney.

### Indian Secondment

**F**OR two Wilton ex-apprentices January 1961 marks the beginning of a new life in a country more than 4000 miles away. The ex-apprentices are **Roger Lobley**, a 22-year-old design assistant in the power station design section, and **Malcolm Wood**, a 25-year-old fitter on Polythene Works.

They are being seconded to ICI (India) for a period of 18 months, during which they will train craft apprentices in the craft school at the Rishra factory of the Alkali and Chemical Corporation of India, a subsidiary of ICI (India). Rishra, a few miles outside Calcutta, has been described as a miniature Wilton and manufactures among other things caustic soda, polythene and other plastics.

The secondment of Mr. Lobley and Mr. Wood to ICI (India) follows the visit to Wilton in May last year of the education officer of that company. During his visit the idea was put forward that Wilton should supply an ex-student apprentice and an ex-craft apprentice to become instructors at the Rishra factory's craft school.

At the craft school they will work a 5½-day week, and the working hours



Mr. Lobley

Mr. Wood

will be slightly longer than at Wilton. To compensate, however, there are about 25 "bank holidays" a year to celebrate Hindu, Christian and Mohammedan festivals.



## Namesake

AMONG a party of Commonwealth journalists who visited Wilton recently was a New Zealander whose home is in Wilton, a suburb of Wellington. He was Mr. Alfred Frost, a leader writer on the *Wellington Post*.

During his visit to the Wilton site he told our reporter about Wilton's namesake in the Dominion. It has a population of 1500 and is situated in hilly country. So hilly, in fact, that there are 39 steps from the front door of his home to the road, and, needless to say, the newspaper boy does not deliver the paper to his house.

## Fatal Accident

MR. K. J. Torrington, Billingham Division education officer, died in Middlesbrough General Hospital on Friday, 9th December, after being injured earlier in the day in a road accident on the Yarm-Thirsk road near Kirkclevington.

With Dr. C. J. Stairmand, a section manager in engineering development department, and Mr. B. W. Firth, a London technical journalist, he was a passenger in a works car driven by Mr. William King when it was in a collision with a lorry. At the time of the accident road conditions in the area were bad, with ice and fog in many places.

Despite quick thinking by Mr. King, who managed to steer the front of the car into a lay-by, it was impossible to avoid the crash. Mr. Torrington, Dr. Stairmand and Mr. King were all injured and taken to Stockton and Thornaby Hospital, and later Mr. Torrington was transferred to Middlesbrough General Hospital.

Dr. Stairmand was detained in Stockton and Thornaby Hospital, where his condition, as we go to press, is stated to be improving and satisfactory, and Mr. King was allowed to go home after treatment.

Mr. Torrington, who leaves a widow and two young children, was 35 and had been Division education officer for four years. He joined the Company in 1952 as a labour officer at Billingham and two years later was seconded to the 'Terylene' Works at Wilton. In

January 1956 he returned to Billingham as assistant Division education officer, and on 1st January 1957 he succeeded Mr. A. F. L. Bowley as Division education officer.

## New ICI Film

A NEW ICI film, *New Minds for a New World*, had its first showing recently at Imperial Chemical House before a specially invited audience of teachers, university lecturers and industrial journalists. It was made for the Company by Seaford Head of Verity Films and is something out of the normal run of recruiting films.

Here are some of the things the *New Scientist* had to say about it:

"The new ICI film, *New Minds for a New World*, ends with Sir Lawrence Bragg saying: 'Industry gets the scientists it deserves.' The film sets out to show that the scientists industry deserves are the best; but it also has a less usual aim. The participants argue the point whether an industrial scientist is capable of leading a full and interesting life, and young men and women express their doubt more forcibly than is normally seen in an industrial film. No firm conclusions are reached, but many young scientists will be better informed as to what there is to do in industry.

\* \* \*

"The film is aimed at sixth-formers, undergraduates and even post-graduate scientists who are uncertain about their careers. It employs the television technique of the unscripted interview, with Christopher Chataway as the interviewer. Those seen include eminent scientists and industrialists, the principal of a college of advanced technology, working scientists and many students—including one who endeared himself by revealing that after four weeks on a vacation course in a factory he decided never to go near industry again. With a university union debate thrown in for good measure, there was at first perhaps too much talking; but this was redeemed by some very good industrial photography later."

The film is available on free loan to schools, universities, parents' associa-

tions and similar organisations from the ICI Film Library at Millbank.

## APPOINTMENTS

Some recent appointments in ICI are: **Alkali Division:** Mr. A. M. Hislop, Assistant Secretary. **Billingham Division:** Mr. F. Anderson, Works Catering Officer. **Dyestuffs Division:** Dr. E. Hoggarth, Works Research and Development Manager. **Heavy Organic Chemicals Division:** Mr. D. J. Allen, Secretary; Dr. C. Cockram, Technical Director; Dr. H. E. North, Production Director; Dr. J. W. Woolcock, hitherto Technical Director, to undertake special responsibility for technical and techno-commercial information and liaison on petrochemical matters, particularly overseas. **Plastics Division:** Mr. F. M. Storrar, Construction Manager, North-east factories.

## RETIREMENTS

Some recent announcements of senior staff retirements are: **Alkali Division:** Mr. T. R. Scott, former Salt Division Research and Development Director (retiring 31st March). **Dyestuffs Division:** Mr. S. Roberts, Manager of Overseas Technical Department (retired 31st December); Mr. R. V. Taylor, an Assistant Overseas Sales Manager (retired 31st December).

## 50 YEARS' SERVICE

The following employees have completed 50 years' service with the Company: **Alkali Division:** Mr. M. Wilkinson, Winnington Works (9th December); Mr. E. Voinas, Winnington Works (9th December).

## OBITUARY

### Mr. T. A. Robertson

It is with deep regret that we record the death on 24th November of Mr. T. A. Robertson, who was chairman of PPL from 1945 to 1954 and its first managing director when the company was formed in 1937.

Mr. Robertson began his career in the chemical industry as private secretary to Sir John Brunner, founder of Brunner, Mond & Co. Ltd. After the first world war he joined the family business of Alex Robertson & Sons, which became part of Cooper, McDougall and Robertson Ltd. He was for some years managing director of their South African company and was largely responsible for the agreement between ICI and CMR which led to the formation of Plant Protection Ltd.

Mr. C. T. Ward, joint managing director of Plant Protection, writes:

The death of T.A.R. came as a great shock to all his friends in Plant Protection Ltd. We had seen Tom weather so many storms during the years when he was our chief. On the too few occasions when he came among us since his retirement his continued interest in the Company, but perhaps more especially in the personal welfare of his old friends, left an impression that he was still one of us. Those of us who worked with him will remember him for his inspiration, wisdom and tolerance, and

along with his many friends in the chemical industry, and indeed all over the world, we shall always cherish the memory of a delightful companion on every occasion.

## A NEW BREAK-THROUGH IN PLASTICS (Continued from page 7)

technical service men throwing a succession of bright red 'Propathene' children's tricycles off the top of the laboratory block and observing them with interest as they hit the ground. Water was kept boiling non-stop in a 'Propathene' vessel for six months, 'Propathene' tubes, rods, sheets, films and filaments were stretched, squeezed, flexed, immersed in this and that corrosive liquid, and subjected to every kind of indignity.

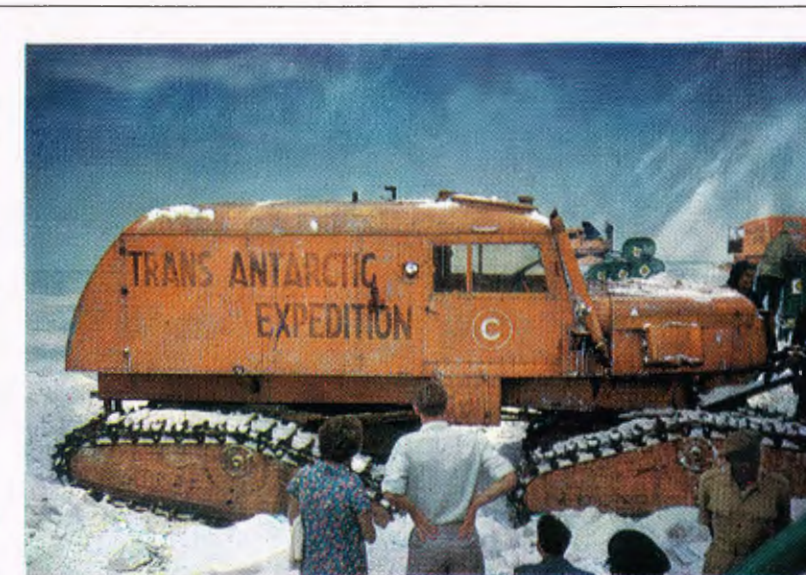
Fibres Division, meanwhile, had negotiated a separate licence from Montecatini for the production of polypropylene filament yarns and staple

fibres and were carrying out their own tests. In these forms the new plastic showed outstanding strength and toughness, making it invaluable for such things as ropes, fishnets and webbings, and yet other properties that promised it a big future in fluffy carpets, knitwear and blankets.

While the development work went ahead, the plant was being built at Wilton. Work began in May 1959 and the completion date was set for September 1960—an almost impossible target, it was thought at the time. Thanks to the kind summer of 1959 and the help of HOC Division and Wilton engineers, and in spite of the complexity of much of the equipment needed, we were able to start the plant dead on time.

The process, on the face of it, is a simple one. Propylene from the Wilton crackers is fed to the reaction vessels, where it mixes with the catalyst. The catalyst does its work, polymerising the propylene to a powder dispersed in liquid. This slurry is pumped to filters that extract the powder. Afterwards the powder is washed, mixed with a stabiliser and pigment, and consolidated into granules.

In practice the process is not so simple as it sounds. The catalyst, made in a separate building and the key to the whole process, must be perfect, or the polymer will emerge not as the isotactic product we want but as something gummy and useless. And even perfect polymer can



**Snow substitute.** Besides soda ash, salt (about 20,000 tons annually) plays its part in the Magadi Soda Co.'s business. It also helped the Shell-BP exhibition at the recent Kenya Royal Show. They were showing the Transantarctic Expedition Snow Cat, which wallowed in 10 tons of Magadi salt as a substitute for the real thing. (Photo: R. L. Sayers)

be rendered useless if the washing process fails to get rid of every particle of catalyst.

With much of the development work and the building of the plant behind us, we can now look forward to harvesting tangible results on a big scale. There are already a few 'Propathene' articles in the shops. Soon there will be more of these injection-moulded goods—sturdy stuff with an excellent finish that will stand up to repeated boiling if need be. You'll see a lot of 'Propathene' film in years to come—it's one of the most promising new packaging materials of recent years. In industry 'Propathene' will be used for piping, for insulating wires and cables, for chemical plant, for components of radio and television sets.

As a filament yarn it may outdo even nylon and 'Terylene' in industrial uses on account of lower prices and great strength, and as a staple fibre it will make soft, bulky "woollens," knitted jumpers and cardigans and jersey fabrics with hard-wearing properties—perhaps not quite as good as 'Terylene'—without "pilling," as some synthetic fibres tend to. For blankets and carpets polypropylene staple fibre has the great advantage of springiness, which means that it recovers quickly from crushing.

One can hardly ask for greater versatility from any polymer. And this, as far as 'Propathene' is concerned, is just the beginning of the story.



# INSIDE NEPAL

By B. R. Goodfellow



Map showing proposed route of the Queen and Prince Philip in India next month

Next month the Queen and the Duke of Edinburgh will be guests of the King and Queen of Nepal in their remote kingdom at the foothills of the Himalayas. It is only since 1953 that Nepal has opened its frontiers to a few foreigners, and B. R. Goodfellow is one of a small band of travellers who have been privileged to visit this fascinating country.

ONLY a dozen years ago Nepal was still a forbidden country, virtually closed to all foreigners. Diplomats had slender contacts with the capital, and very rarely a distinguished botanist or an Indian survey party had been allowed to travel into the interior.

Nepal, like its neighbours Tibet and the great empire of China beyond, was proud of its ancient civilisation and contented with its way of life. The Orientals distrusted the first explorers from the West, who, however peacefully they came at first, soon used their superior military strength and skill to establish themselves and pursue their trade. China had not the power to resist, nor had Japan, nor India; and by the middle of the last century Europeans were entrenched throughout most of Asia. Nepal was never humiliated in this way because it suited the British rulers of India to preserve a neutral ring of buffer

states between India and her neighbours to the north.

Nepal is a mountain kingdom, about 500 miles long and 100 miles wide, just about the size of England and Wales. It rises from forested plains below the foothills through a tangle of vastly complicated hills and valleys to the main range of the Himalayas. Half the highest mountains of the world, including Everest, lie within Nepal or along its border with Tibet. In such a country travel is slow and arduous. Mountain tracks are too difficult for any wheeled vehicle or even for pack animals, and all loads are carried by porters. So there had been little mingling of the peoples, and they vary valley by valley, from the Tibetan types like the famous Sherpas to the Gurkhas, who are more like the hill tribes of India.

Through the Gurkhas Nepal had almost its only contact with the outside world. For many years these magnificent



Market in Patan, the old capital of Nepal





Himalayas beyond the valley of Katmandu (24,000 ft. peaks of the Ganesh Himal)

men have been recruited to serve with their own regiments in the British and Indian armies. Their skill and bravery in the two world wars are famous, and for generations they have brought back to their home villages their savings and their knowledge of the world outside.

For a hundred years until 1951 Nepal was ruled, from its capital in Katmandu, by an hereditary prime minister, and the King was only a picturesque figurehead. But when India gained her independence from Britain in 1947 the murmuring discontent with the medieval form of government in Nepal could no longer be resisted. The Prime Minister resigned. A government with an elected assembly and a cabinet was established, and the King resumed his powers as a constitutional monarch. It is his successor, the present king, who recently visited London.

At the same time came a different attitude to foreign visitors, and at last the door was cautiously opened to

those who could show good reason for wishing to come to Nepal.

What a challenge this was to the adventurous! Here, waiting to be explored, was a whole new country offering mountain scenery on a grand scale, all kinds of interesting folk, flowers, brilliant birds and a varied fauna; rhinoceros, tiger and even the Abominable Snowman.

The mountaineers were the first to go, with W. H. Tilman in the van. He found at once a possible route to Everest from the south. E. E. Shipton followed and developed the route. As everyone knows, this route was followed by the successful British party to the summit in 1953. In the last ten years dozens of mountaineering expeditions have followed. Although all the main peaks have now been climbed, some hundreds of lesser peaks of over 20,000 ft. remain. These expeditions are not for the ordinary man because at least three months' leave is needed to make an expedition worth while, but many

young men are raising every penny they can to go there for the big adventure of their lives.

To me the chance of paying a visit to Nepal, if only to look briefly at the country and the mountains with no hope of climbing them, was irresistible, for I had first tasted the joys of travel in the Himalayas when serving in India during the war. My chance to go to Nepal came in 1953, when I was in India with an ICI mission, so to Nepal I went on my annual holiday with an old climbing friend who was also visiting India.

We stayed first in Katmandu as guests of the British Ambassador, and there we planned our journey. A somewhat precarious aircraft took us to Pokhara, the second city of Nepal, in twenty minutes; had we done the journey on foot it would have taken us ten days.

This really was a flying start, for Pokhara lies immediately under the great Himalayas. A stupendous peak of rock and ice 20,000 ft. above us filled the view beyond the

cobbled street of neat little ochre-washed houses. We easily found men to carry our loads, and off we went into the unknown. It was extraordinary to realise that within a few miles of the town we were entering country into which Europeans had never penetrated before.

We soon got our routine established. Perhaps the greatest pleasure in this kind of travel is its leisurely and almost luxurious character. One walks all day through superb scenery at the gentle pace of laden porters, and in the afternoon one comes upon a meadow by a river or in a forest clearing, the perfect place to halt. Willing hands help to set up camp, and, in the tradition of the East, porters become servants and do all the camp chores.

The first night we camped on a carpet of scarlet blossom fallen from a coral tree. Later on and 10,000 ft. higher up, we camped in a forest of rhododendron in full bloom, with a camp fire to take the nip out of the frosty air and a vast



panorama of ice peaks all about us. We had hoped to climb up among these peaks, but had to respect the deep superstition of the villagers. They feared the gods living in the mountains who, if we disturbed them, would bring storms and avalanches down on their ripening crops. So we could only walk up to the limit of summer pastures to a height of 16,000 ft., but from this height we were rewarded with some of the most magnificent mountain views which I have ever had the good fortune to see.

When the Queen and the Duke of Edinburgh make their official visit to Nepal next February, they will have all too little time and cannot hope to travel far from Katmandu, although it has been said that a tiger shoot has been arranged for them. In addition, surely it will be arranged for the royal Comet to fly the Queen close up to Mount Everest, for a view of the great peaks from the air is one of the most magnificent sights of the world and few have been privileged to see it. The few include Sir Alexander Fleck, who flew to Everest when he accompanied the Duke of Edinburgh to India last year.

What sort of a place is Katmandu, and what will the Queen see there? It is a perfect site for a capital city. The "Plain of Nepal" in which the city is set is a saucer 4500 ft. up, with 9000 ft. hills round its rim. Beyond the rim the vast Himalayan range is a backcloth. The climate is perfect, for the valley is sheltered from the heat and dust of India and the air is cooled and washed by mountain rains. The fields, watered by clear streams, are cultivated intensively, even to excess.

The city is the meeting place of all the varied people of the country and of its immediate neighbours—a fantastic mixture of races and religions. The great Buddhist monastery of Bodnath, with all-seeing eyes staring from the four corners of the Stupa, is second only to Lhasa in holiness, and Tibetans come with their women, and even with children in arms, over the 19,000 ft. passes of the Himalayas on their pilgrimages.

Down in the town, and especially in the older city of Patan a few miles away, the buildings show the characteristic architecture of the Newars, the old dynasty of Nepal—richly carved door-posts, edge-tilted roofs, and a profusion of guardian images of fabulous beasts, all with a strongly Chinese flavour. The old temple precincts are alive with the day-to-day bazaar life typical of an Eastern



**Dancers honouring** the first European visitors to their Himalayan village. A picture taken by the author in 1953

city. The locals spread out their fruit and vegetables, Indian merchants display their brightly coloured cloth, and the Tibetan shops cater for the needs of the pilgrims.

Until recently the valley was hard to reach, for the river gorge is difficult, and the high passes over the rim are only fit to travel on foot; and until a year or two ago there were no roads in Nepal other than a few miles in and near the capital. In Pokhara we were told that the first wheeled vehicle ever to come there was an aircraft. In Katmandu there were quite a number of cars, and every one of these was brought in over the 7000 ft. passes perched on a lattice framework of bamboo poles on the heads of a hundred porters. When they carried in the king's Rolls-Royce—traditionally painted canary yellow—it must have been a fantastic sight, even though they took the wheels off to make it a little less heavy.

Now all this is rapidly changing. A road has been built from India. There is a daily air service from Calcutta. Katmandu has every kind of Western adviser on medicine, agriculture, education, hydro-electric development. Tourists are increasing and there is now a good hotel—formerly one of the royal residences. But away from the capital things remain much as they have always been. For those who seek their pleasures in places which the ways of the West have not reached, where the traveller meets hospitality and kindness, there can be nowhere more enchanting than Nepal.

# January IN THE GARDEN

ORDER SEEDS EARLY

By PERCY THROWER

**D**URING the next week or so I intend to enjoy the dark winter evenings by the warmth of the fireside with the seed catalogues. One of my first New Year jobs is to make out a list of the seeds I shall require—possibly one of the most important jobs of the year. It is, I think, essential to order the seeds early and particularly this year.

After such a wet summer as we had last year, many kinds and varieties may be in short supply and we shall be disappointed if we do not get those we want.

If you cast your mind back a couple of years you will recall that runner bean seeds were very scarce, and it could be the same this spring after such a bad harvest. The seed catalogues as usual came with the Christmas post, and a good seed catalogue makes very interesting reading. I can enjoy hours looking through for new varieties I intend to try.

Be sure when you order or buy your seeds that you are buying good seeds from a reliable source. That is, I think, more important than anything else. Nothing can be more disappointing than poor results from inferior seed. Apart from all the work and time taken to grow the plants and vegetables it is money wasted. It is far better to spend those extra few coppers in the first place.

There are, I know, many flower

seeds listed in the catalogues that you would like to grow, but have you the means of growing them? Some seeds such as begonias, salvias and others need quite high temperatures to get the seeds to germinate and to grow the plants on after germination. To grow such as these successfully a greenhouse is required, and in that greenhouse a seed raiser or frame where a minimum temperature of 55° F. can be maintained.

The popular half-hardy annuals, which include French and African marigolds, petunias, lobelia, nemesia and cosmea, do not need such high temperatures but do require protection until the fear of frost has gone, which is not before late May. These can be grown in a garden frame if the seed is sown in late March or early April. The garden frame can now be made into a miniature greenhouse by electrically heated space-warming cables, and there are also the soil-warming cables which cost very little each week in electricity.

**M**y reason for mentioning this is, there is no point in buying packets of seeds, some of which are quite expensive, unless you have means of growing them. For those people without a greenhouse or frame there are no better flowers to grow from seed than the hardy annuals. These can be sown outside from

March to May. They are sun-loving plants and must have an open sunny position, but they do not need a very rich soil.

Still listed among the vegetables are varieties which I can well remember my father growing before I left school, and still they hold their own. There are many new varieties of vegetables in all the seed lists. By all means try some of the new ones, as it makes our gardening all the more interesting; but rely mainly on those well-tried varieties which we know from experience do well in our particular garden or district.

**V**ARIETIES of recent introduction I intend to try are Early Onward peas, which sound to me like an early form of that famous variety Onward; and Marathon broad bean, first introduced in 1957 but as yet not tried by me. I think it would be difficult to improve on the well-known runner bean Streamline. January King Cabbage is a must as far as I am concerned, the hardiest and best winter cabbage of all. Of onions, I select Ailsa Craig and Autumn Queen. Last year I saw some of the recent introductions in potatoes and was most impressed by Craig's Alliance, an early potato. And among main crop take note of Ulster Torch, claimed to be blight resistant.

Order your seeds and potatoes now and avoid being disappointed.



## Drawtwist Operator

Interviewed by Denzil Batchelor

TO the ordinary member of the public, 39-year-old Stanley Meaburn's job sounds mysterious enough to win him one of those neatly rolled diplomas earned by beating the panel on What's My Line—he's a drawtwist operator.

"Is there," Lady Barnett would be sure to ask, "an end product?" There is indeed: it is 'Terylene.'

For Stanley is one of several hundred operators on the job, helping to produce 'Terylene' at Wilton Works. He is in charge of a multi-spindle machine which stretches and treats between seven and twelve hundred pounds of the product a day. To explain his task simply: each of his machine positions is loaded with a package of spun 'Terylene,' produced originally from a liquid para-xylene, derived from crude oil, ethylene glycol and other chemicals, and thence from melted chips, each somewhat resembling half a dried split pea.

These pounds of spun 'Terylene' (it would be revealing a trade secret to tell you exactly how many) are—with their many separate filaments to each thread—wound on a spin bobbin. The spun yarn descends via two rollers and a course of heat treatment, during which it is stretched, to the drawtwist bobbin, a few inches above ground level. The operation is designed to treat and stretch the spun 'Terylene,' making sure that no defects occur during the process.

★ ★ ★

Meaburn's job is twofold. He replaces when necessary the empty spin bobbin package and changes the drawtwist bobbin, the latter somewhat resembling a full milk bottle, when it has collected its full 1 lb. or 2 lb. load of 'Terylene': there are some fifty miles of thread on each 1 lb. bobbin. Secondly, he constantly checks the threadline on his machines to make sure that no faults crop up in the process. (There are, in all, some fifty or sixty possible faults that might develop.) All going well, Meaburn's machines will process some £400 to £500 worth of the product in a day.

Meaburn came to ICI in 1954 from working at a steelworks. He has never regretted the step. He was a semi-skilled worker in the steelworks—he is highly skilled in his present job.

In the early days the operations were relatively easy for him to master—he reckons that the process has doubled in pace since he was first initiated in May 1955.

One of the reasons it has improved is Meaburn himself. His keen interest in his work led him to suggest a method now in use for producing transfer tails on bobbins. This brought him an award based on a percentage of what the idea has earned: so far the use of his idea has enriched him by £220. It may continue to enrich him further.

He was also commended for detecting abnormal yarn on his machine in April 1959, and has received small awards for two other suggestions he has brought to the notice of the management.

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You will not be surprised to learn that he has recently put forward two further suggestions for technical improvements: indeed, he told me that he is at present considering a quite revolutionary idea for advancing the process—swearing me to secrecy on the subject. (My promise that wild horses would not induce me to divulge the least hint was the more readily given because of my complete inability to understand the technical intricacies of this visionary improvement.)

It surely buoys him up to have been a pioneer in the empire of 'Terylene': knowing that the material he makes now plays its part in the manufacture of shirts, ropes, curtain nets, sailcloths for yachts and so much else—and that the British invention is made under licence throughout the world from France to Japan, from Western Germany to the United States.

Meaburn is a short, fair-haired, alert man with his heart in his work and a keen eye to seek out mechanical improvements everywhere—if he has a pipe-dream it is of reincarnation as a full-time inventor. He's a married man with three children and one hobby. That is, or was, his garden; alas, it is being taken from him to become a building site. On it in the past, with his father's help, he has specialised in "freaks"—round cucumbers, white tomatoes, and—this year—blue, red and yellow sweet corn. You can't keep a good inventor down.

Stanley Meaburn





# NEWS IN PICTURES

## Home and Overseas



**Design winner.** At the annual International Caravan Exhibition held in London last month, the Imperial Aluminium Co. Ltd. stand, designed by Mr. Colin Brown of Metals Division, was awarded the United Dominions Trust trophy for the best stand in the Supplies and Services section for stands under 250 sq. ft. Impalco, a subsidiary company of ICI which manufactures aluminium, exhibited aluminium extrusions for caravans. *Left:* Mr. M. J. Spillane, the ICI representative, receives the award from Sir Keith Joseph, parliamentary secretary to the Ministry of Housing and Local Government, at a ceremony held at the Café Royal



**Rapid progress.** This artist's impression of part of ICI's Severnside site shows what the Heavy Organic Chemicals Division plant will look like when completed at the end of the year. Between them HOC and Billingham Divisions are spending £15 million on new plant there to produce 35,000 tons a year of ethylene oxide, ethylene glycol and associated products (HOC), and 100,000 tons a year of ammonia, and urea and fertilizers (Billingham)



**Safer motoring.** Mr. Gerald Nabarro, M.P., has given an example to other motorists by having his cars fitted with Britax diagonal 'Terylene' safety belts. Here he is seen at the wheel of his new Daimler Majestic, which bears the number plate NAB1. The Britax belt, originally developed by the Swedish State Power Board for their own employees, has also been adopted by Princess Margaret and Mr. Armstrong-Jones



**This budding engineer** thinks maintenance may be necessary, but the tricycle made in 'Propathene' plastic (ICI brand of polypropylene) has great rigidity and strength, is not likely to come to grief, and cannot harm the child. Made by Chudleigh Manufacturing Co., it is available in two-colour combinations of red and blue, yellow and red or blue and yellow. Price approximately 35s. at leading chain stores





**'Visqueen' for mink pens.** Our pictures were taken at a mink farm in Oxfordshire, where 'Visqueen' has been used in constructing the animal pens. Our picture (left) shows the extent to which 500 gauge black 'Visqueen' has been used to roof the pens, which have been in continuous use since they were built in 1958. Clear 'Visqueen' is used for the sides to protect the mink from the elements



**Mr. George Doody (right)** of Billingham Division's Labour Department receives, from Brigadier C. C. Fairweather, gifts in recognition of his work for amateur boxing in the north-east. Mr. Doody, who has been associated with the Synthonia boxing section for many years, has been a referee and judge and has served as a north-east and northern counties official



**Diamond wedding.** Mr. and Mrs. R. Hunt celebrated their diamond wedding last month. Mr. Hunt, a former employee of the United Alkali Co. which later became part of ICI, was a member of the first Works Council, serving for eleven years until he retired



**To play for county.** Seventeen-year old Peter Cartwright (Pharmaceuticals Division's Accounts Dept.) has been chosen to play centre forward for the Cheshire Association of Boys Clubs football team. Chosen after the recent county trials, the selectors were impressed by his speed and ball control. Now another honour has come his way—a place in the Altrincham F.A. team

**Record break.** Billiards and snooker celebrity John Pulman was the guest of the Head Office Billiards and Snooker Club recently. During a match played against two club members he scored a break of 71 including seven blacks—by far the highest ever made on this club's table. The highlight of the evening was his exhibition of trick shots in both billiards and snooker. Mr. C. Wilson, Head Office Personnel Manager, who introduced Mr. Pulman, is seen, *extreme left*, with club members Mr. R. A. Roper and Mr. H. Farrah (club secretary)



**Operation ash disposal.** New dumping ground for ash from General Chemicals Division's Weston Point power station, is marshland on the far side of the Weaver Canal. Here being lowered into the canal is the group of four special rubber-lined pipes through which the ash will be blown



**Croquet cup.** Members of ICI (Export) Ltd. in Frankfurt have taken up croquet, and now they have a cup which is to be competed for annually. Here in the office garden after their most recent tournament are (left to right) Herr Flath, Dr. F. H. Peakin (local director), Mrs. Peakin presenting the cup to winner Herr Stark, Fräulein Gallus and Herr Bondel



**Rare dog wins prize.** Hungarian vizslas are rare dogs in England; there are only about 20 of this breed in the country. This one, owned by Miss Elizabeth Guthrie of Billingham Division, took second prize in the owners and dogs section of the Division's Synthonia Canine Section show recently



# SOCCER at the CROSSROADS

Jimmy Hill talks to Denzil Batchelor



Jimmy Hill—negotiator for a higher wage for players

Denzil Batchelor sets out to investigate the background of the present dispute between players and the Football League. He asks Jimmy Hill, boss of the Professional Footballers Association, some searching questions. Together they thrash out the whole question of football reform—from better conditions for players to fewer league matches.

*Denzil Batchelor:* Jimmy Hill, let me get you into focus. You're 32, near the end of your second term as Chairman of the Professional Footballers Association, and, as such, the spearhead of the recent attack on the Football League for their refusal to change conditions for the footballer of today.

*Jimmy Hill:* The spearhead? Well—anyway, the mouthpiece.

*Batchelor:* You were captain of Fulham for several seasons. A tournament lawn tennis player. A good club cricketer—your sister played for England. Now, Jimmy, some time ago I talked to Stan Cullis about the ladder of success in football: the road from the school team to the Cup-winning side. Right—that was a summing-up of the past, or the picture brought up to date, if you like.

Well, to be up to date I should say that as we talk the players here voted to strike on 14th January unless the League changes its tune. By that time I expect steps will have been taken to avoid strike action. I am guessing but I believe the Ministry of Labour may be asked to arbitrate. But I think this will only patch up the quarrel, not resolve it. In the players' minds the situation has deteriorated steadily since the war. Now, I want to talk to you about the player of

tomorrow—if there is a tomorrow. Let's suppose there is. And let's suppose X, a good footballer of 17 (the signing-on age), comes to you to ask whether he should become a professional. What's your answer?

*Hill:* Let me get this clear. X is a good footballer—not a genius like Johnny Haynes. (I wouldn't presume to advise a Haynes: you couldn't interfere with such a player's destiny.) But your player has talent and promise. Well, I say *yes*, he should become a professional—so long as he had me to advise him all the way through his career!

*Batchelor:* He'd be lucky. I'm sure.

*Hill:* If he didn't have me to help him, he'd need some successor to me who has studied all the angles. Being good at football is no longer enough.

*Batchelor:* You and your Association have for long been locked in battle with the Football League over—well, over X's future. Before he's to benefit from having reached the top of the ladder, you insist on certain changes in his favour?

*Hill:* Two main changes: and I hope and believe they'll come about—not just as a mere compromise, but *as of right*—during X's playing career, which I think we can agree to consider likely to be about ten years.

*Batchelor:* The first, I suppose, is the abolition of the maximum wage—at this time existing only in England. Until your last dispute with the League ended it stood at £20 a week, wasn't it, with a bonus of £4 for a win and £2 for a draw?

*Hill:* As a matter of fact, that's the *second* point at



Denzil Batchelor, formerly sporting editor of *Picture Post* and one of Britain's top sports writers.

issue. The first is that the P.F.A. has been demanding the player's right to negotiate his own contract: a right given to footballers in every Continental and South American country.

*Batchelor:* But even when your row began every player had a contract with his club?

*Hill:* A completely one-sided affair. The player guaranteed to serve the club for five or ten years; they guaranteed to employ him only for one season.

*Batchelor:* It's a point. You want more freedom for X, and higher wages during the ten years' duration of his football career.

*Hill:* Not even exactly that. I've been insisting on his *right* to negotiate his contract, and his *right* to get as much money as he's worth as an entertainer. Tommy Steele's manager doesn't argue—he's only on for ninety minutes a week, therefore he can't be worth more than £20.

*Batchelor:* But how many clubs can afford to pay



more? They tell me that three-fifths of the League's clubs are in the red already.

*Hill:* I've never wanted to force any of them to pay more. I want X to have a right to market himself where he can—so that he can get more if there's more to be earned during his brief career.

*Batchelor:* Well, there may not be many markets. Fewer people are watching football all the time. In the first three months of this season, haven't attendances dropped by between £1½ and £2 million?

*Hill:* By 15%, yes. But admission charges have gone up by 25%.

*Batchelor:* All the same, public interest is dropping. If X signs a contract, he's joining a fading profession—an entertainment that's ceasing to appeal to the public.

There are at least forty-two dreary League matches a season: only really of public interest as Pools-fodder. It can't, and it won't go on! Before X has finished with football there'll be a far smaller League, far fewer and much better paid players; and, incidentally, as a result, a manageable *cadre* of stars from which we might draw an international side fit to do us justice in the World Cup. Now what would you, as the Father Figure of professional footballers, have to say about such a Shape of Football to come?

*Hill:* I think I'd welcome it. We certainly argue that we play far too much League football, and that most of it's boring because of lack of incentive. Indeed, I can imagine the time coming when X, if he's good enough, will play in a League of two Divisions with sixteen teams in each.

*Batchelor:* Instead of four Divisions with 92 clubs. Well, what will happen to all but the very cream of professional players then? Won't they go on the dole?

*Hill:* Every week I get letters from Australia asking if we can't send them part-time players—good footballers but not star material. They can afford to pay them £8 a game and find them part-time jobs at £12 a week. Why should we export players when we could offer that as a solution?

*Batchelor:* Why indeed? But I can imagine lots of League managers objecting to part-time players. What about their favourite Sacred Cow—the training schedule?

*Hill:* You know as well as I do that training is often greatly overdone. It becomes a wearisomeness of the spirit—eight hours a week is all that's needed: easy to fit in with a part-time job, especially now that so many grounds have floodlighting.

*Batchelor:* Smaller League programmes . . . Higher pay for stars . . . Every player able to negotiate his own contract—I don't know why, in law, he hasn't a right to do so today. The future is beginning to make sense.

But there's this point: up to January 1958 only 12 of 1681 players—1 in 140—got £1000 a year or more. Then there was a maximum pay increase from £17 to £20 at the start of the 1958–59 season; and today 962 out of 1935 footballers (nearly 50%) receive over £1000 a year. Isn't that a quick enough improvement for you?

*Hill:* No. Those players have only gone from just under £1000 a year to a little bit over. That's not good enough, considering the rocketing cost of living. The plain fact is that the average League player makes £14 10s. a week today, exclusive of bonus for wins or draws. If that's all that X is going to earn when he reaches his peak, he'd be better off as a traffic warden or a dustman.

*Batchelor:* The clubs plead they can't afford to pay more—yet they'll spend tens of thousands on transfer fees. I've no doubt that this is because at the season's end the tax people can take their cut of £50,000 profit but they can't take their cut of a £50,000 player.

*Hill:* And don't forget that ground-improvement—greatly overdue on almost all grounds in the country—is taxable, though ground repairs aren't. Ah well, tax avoidance is legal—tax evasion is a crime.

*Batchelor:* I've always believed that players should have a share of their transfer fees.

*Hill:* I think they should. The most we've been asking for would be 2½% or possibly 5% once a player's been transferred for £10,000 or more. After that he'd expect no cut in any transfer except for a fee exceeding that sum, and then only a percentage on the increase. This would establish his right to a share of money earned by his improvement while playing for the club.

*Batchelor:* What about benefits?

*Hill:* I think your friend X will find things improved when he becomes eligible for one after five years with a club. At present he only gets his benefit money if the club likes the look of his face at the end of that period. Well, a player can play well for four years and lose form in the fifth, or quarrel with his club: bang goes his benefit! We want him to be entitled to it, as of right.

*Batchelor:* Are you satisfied with the insurance players carry?

*Hill:* Insurance is the P.F.A.'s responsibility: we pay



**Soccer fans**—will they be happy with fewer League matches, luxury stands but higher admission charges?

up to £500 for a serious disability. But we do think that clubs should give us the right to stage one match a season to raise funds for this.

*Batchelor:* Don't you feel that the Pools, which make all the really big money out of football, should contribute to X's prospects?

*Hill:* Because of the legal decision about their use of clubs' copyright of fixture lists, they do contribute to the clubs; but the clubs don't pass this on to players.

*Batchelor:* I think your underlying feeling is that the stars who draw the crowds don't get enough for their efforts—the Barcelona players got a bonus of £1000 for beating Real Madrid in the European Cup, and our boys get £20 for an all-important League game. If that's your case, I agree with you. Why do you think the League and the clubs don't?

*Hill:* Committee-men and directors expect players to be full-time footballers—but they are not full-time legislators. Most of them are businessmen who take on ruling football as a part-time activity. There are forty-eight clubs represented in the League, and any change has to be agreed by a three-quarter majority. What hope have you?

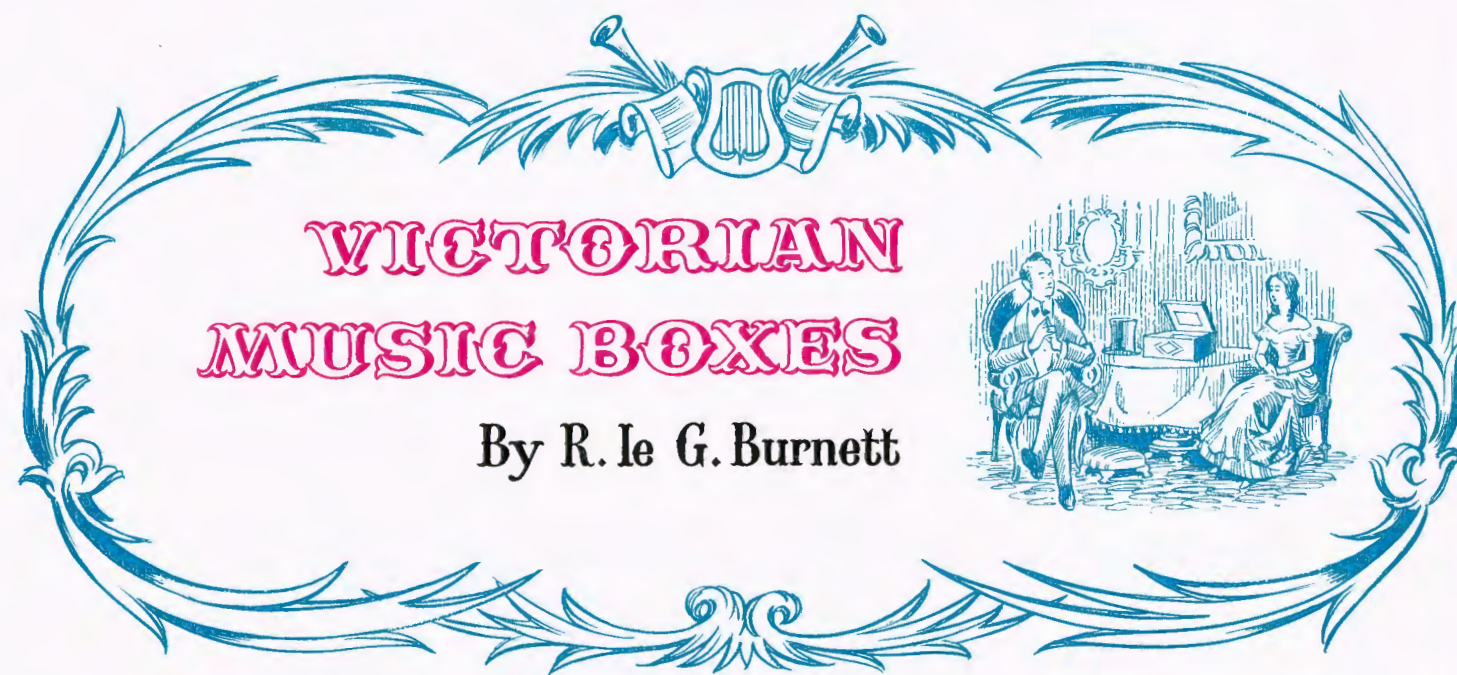
*Batchelor:* You feel that what the League and the clubs need is a core of businessmen whose business is football?

*Hill:* I certainly do. Three-fifths of the clubs may be facing a crisis, but did you ever hear of a director resigning? Yet the game is facing a crisis. Television has cut gates. Conditions for spectators—who nowadays have money to spend—are appalling. It needs dedicated businessmen to save football.

The time is coming when we'll have much smaller crowds watching star sides in great luxury and paying high admission charges like the crowds on the continent. Fifteen thousand is an average crowd to watch the greatest teams—yet the players get three times as much pay as our boys do. I hope with all my heart that X, your 16-year-old boy signing on this season, will inherit a rich future of that sort, and I think he will.

To sum up, I'll make two predictions. In ten years from now the average player will be earning the equivalent of £1500 a year of today's money, and he will be absolutely free to negotiate his own contract. *Batchelor:* I hope you're right. And if you are, it'll be largely due to your efforts.





With their tiny, tinkling sounds, Victorian musical boxes vividly recall the quiet enchantment of a Victorian home. Even a year ago they could be picked up for under £5, but today values have risen sharply.

**A** HUNDRED years ago, unless people played a musical instrument themselves, the only music in the home came from musical boxes. And what a contrast their soft and silvery sound presents with the reproduced music of today!

All musical boxes depend on the basic invention of Antoine Favre working in Geneva in 1796. He originated the use of small tongues of steel to produce musical notes. The tongues of steel are made to sound by pins on a

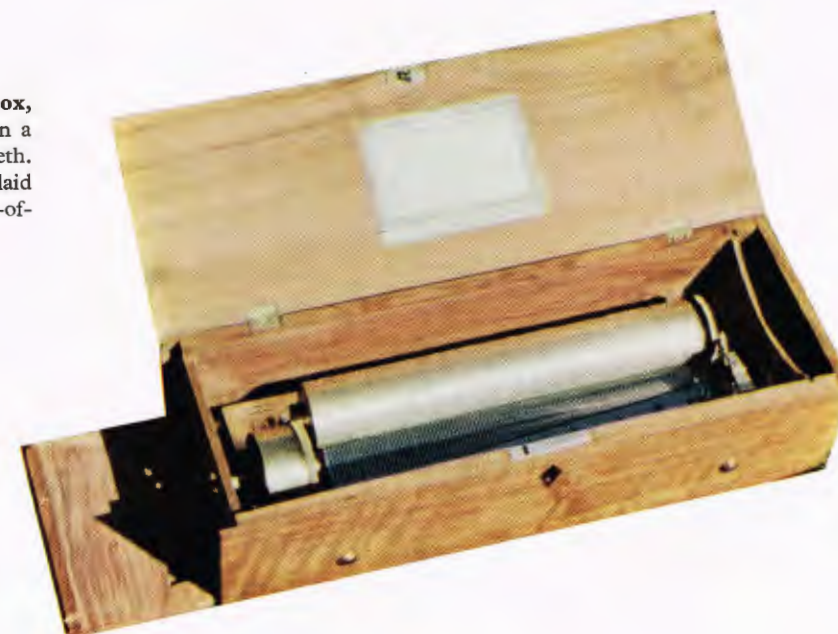
rotating cylinder. These lift the tips of the steel tongues and set them vibrating as they fall back. The position of the pins and the notes emitted by the steel tongues determine the tune. The row of steel tongues or teeth is generally known as the comb.

In the early years of the nineteenth century two important improvements were made. These were the attachment of lead weights to the undersides of the teeth sounding the lower notes and the introduction of dampers.



**Organ-box** by Conchon, playing six operatic airs. There are two combs of 41 teeth each and 18 organ notes operated by levers between the combs. The wind for the organ notes is provided by bellows beneath the visible mechanism. Inlaid case 21 in. long. Made about 1900

**Small key-wind box**, playing four waltzes on a single comb of 110 teeth. Case 13½ in. long inlaid with silver and mother-of-pearl. About 1845



**Early key-wind "sacred" box**, playing six hymn tunes on a single comb with 112 teeth. Plain case 16½ in. long, made by Nicole Frères of Geneva, the most famous of the makers, about 1840







**Large bell-box** playing twelve tunes. The comb has 52 teeth, and there are nine bells. Case 22 in. long, extensively inlaid with domed lid. About 1890



**Small lever-wind box** playing six tunes on a single comb of 52 teeth. Case 12½ in. long with flat inlaid lid. About 1870



**Musical snuff-box** playing two tunes on a comb containing 70 teeth made in sections of five at a time. Case 3½ in. long with picture of the Luxembourg Palace, Paris, on the lid. About 1850



The weighting of the lower teeth greatly extended the range of the bass notes and made them much more resonant. The dampers, consisting of small pieces of hair-spring under the tips of the lower teeth of the comb, prevented the unpleasant chattering noise which is otherwise produced when a pin on the cylinder comes in contact with a tooth already vibrating.

Initially the teeth of the comb were made and secured individually, but quite soon they were made in groups of three to five, and finally the teeth were cut from a single piece of steel, giving the one-piece comb.

Among the earliest musical boxes are the small musical snuff-boxes. These are 3-4 in. long and have cases of black horn or tortoiseshell, often with a picture engraved or impressed on the lid. A sheet of transparent horn protects the movement, which normally plays two tunes. With 60-80 very fine teeth in the comb the musical snuff-boxes usually play very well, though rather softly by modern standards.

Then there are what one might call the classical Victorian boxes, playing 4-12 tunes on a single comb. These may vary from small boxes, 8-9 in. long, with 40-50 teeth in the comb, to mammoth boxes 3-4 ft. long with as many as 200 teeth. At first the cases were entirely plain with a flat lid, and winding was by means of a key from one end. Later the cases were decorated with inlay, the movement was protected by glass, and a winding lever displaced

the key. Finally the lids were made slightly domed.

In an attempt to make their boxes more attractive the makers also added various effects. The most common of these were bells, which might vary from 3 to 12 in number. Some boxes had drums and castanets as well, and some even a small reed organ. The bells, drums and castanets were operated by levers attached to the teeth of secondary combs, the organ notes by brass levers in place of comb teeth. These extra effects add variety, but the music is never so attractive as that produced by the combs alone.

And what of the cost of collecting musical boxes? Prices are rising all the time, but it is still possible to find quite a good box for £5 to £10. Special boxes cost more, but by taking one which requires some attention one may be able to pick up a Victorian musical box for £3 to £5. For this price, of course, it is not possible to obtain a box in first-class condition. But a box may be obtained which is basically sound; and the work of cleaning and overhauling, to bring it into first-class condition, provides a great part of the pleasure of collecting.

The manufacture of musical boxes virtually came to an end in 1914. First the phonograph and then the gramophone took their place. But the tiny charming sounds first produced by Antoine Favre in 1796 remain to remind us of a quieter age, when pleasures were simpler and wonders less menacing.





*Katmandu, Nepal*

*Photo by B. R. Goodfellow (Head Office)*